In the Claims

1. (Previously presented) A bimodal polyethylene comprising ethylene derived units and units derived from at least one of a C_4 to C_{12} olefin;

wherein the polyethylene has a density of from 0.940 to 0.970 g/cm^3;

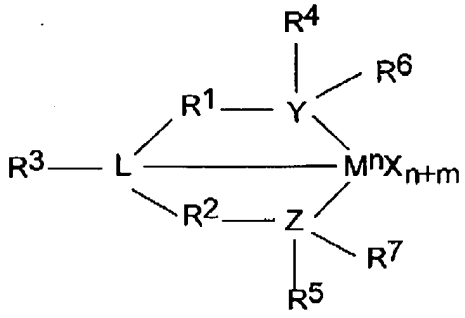
an I_{21}/I_2 of 80 or more;

a residual zirconium or hafnium metal content;

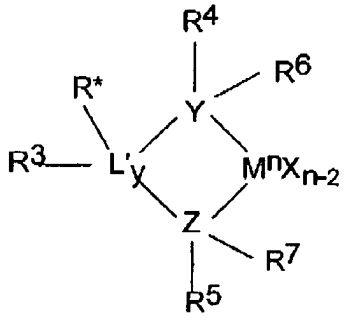
a Mw/Mn of from 20 to 60; and

wherein the polyethylene comprises a high molecular weight component and a low molecular weight component, the high molecular weight component present from 40 to 60 weight percent based on the total polyethylene, and wherein the high molecular weight component has a weight average molecular weight Mw of greater than 100,000 a.m.u., and wherein the high molecular weight component has a Mw/Mn between 4.50 and 6.88,

wherein said bimodal polyethylene is formed in a single reactor by contacting olefins and a catalyst composition comprising a Group 15 containing compound and a bulky ligand metallocene catalyst compound; wherein the Group 15 containing metal compound is represented by the formulae:



or



wherein M is a Group 4, 5 or 6 metal;

each X is independently a leaving group;

y is 0 or 1;

n is the oxidation state of M;

m is the formal charge of the ligand comprising the YZL or YZL' groups;

L is Nitrogen;

L' is a Group 15 or 16 element or Group 14 containing group;

Y is Nitrogen;

Z is Nitrogen;

R^1 and R^2 are independently a C_1 to C_{20} hydrocarbon group, a heteroatom containing group having up to twenty carbon atoms, silicon, germanium, tin, lead, or phosphorus; wherein R^1 and R^2 may be interconnected to each other;

R^3 is absent or a hydrocarbon group, hydrogen, a halogen, a heteroatom containing group;

R^4 and R^5 are independently an alkyl group, an aryl group, substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, a cyclic arylalkyl group, a substituted cyclic arylalkyl group or a multiple ring system;

wherein

R^4 and R^5 may be interconnected to each other;

R^6 and R^7 are independently absent, hydrogen, an alkyl group, halogen, heteroatom or a hydrocarbyl group;

R^* is absent, hydrogen, a Group 14 atom containing group, a halogen, or a heteroatom containing group, and

wherein a polyethylene pipe comprising the bimodal polyethylene has a predicted D-4 Tc for 110 mm pipe of less than -5°C when tested according to ISO DIS 13477/ASTM F1589.

2. (Original) The bimodal polyethylene of Claim 1, possessing an I_2 of 0.5 g/ 10 min or less.

3. (Original) The bimodal polyethylene of Claim 1, wherein the weight average molecular weight Mw of the high molecular weight component is greater than 150,000 a.m.u.

4. (Original) The bimodal polyethylene of Claim 1, wherein the weight average molecular weight Mw of the high molecular weight component is greater than 200,000 a.m.u.

5. (Previously Presented) The bimodal polyethylene of Claim 1, wherein the zirconium or hafnium metal residuals content is 1.5 ppm to 5.0 ppm.

6. (Original) The bimodal polyethylene of Claim 1, wherein the value of I_{21}/I_2 is greater than 90.

7. (Previously Presented) The bimodal polyethylene of Claim 1, possessing a notch tensile test result of greater than 150 hours at 3.0 MPa when determined according to ASTM-F1473.

8. (Original) The bimodal polyethylene of Claim 1, wherein a pipe with carbon black formed from the polyethylene is able to withstand at least 50 years at an ambient temperature of 20°C, using water as the internal test medium and either water or air as the outside environment (Hydrostatic (hoop) stress as measured by ISO TR 9080).

9. (Previously Presented) The bimodal polyethylene of Claim 1, wherein a pipe with carbon black formed from the polyethylene possesses a predicted S-4 Tc for 110 mm of less than -40°C when determined according to ISO DIS 13477 / ASTM F1589.

10. (Original) The bimodal polyethylene of Claim 1, wherein a pipe with carbon black formed from the polyethylene possesses a predicted S-4 Tc for 110mm pipe of less than -15°C (ISO DIS 13477/ASTM F1589).

11. (Original) The bimodal polyethylene of Claim 1, wherein when formed into a 0.5mil (13μ) film possesses an MD Tear of between about 5 g/mil and 25 g/mil.

12. (Original) The bimodal polyethylene of Claim 1, wherein when formed into a 0.5 mil (13μ) film possesses an MD Tear of between about 15 g/mil and 25 g/mil.

13. (Cancelled)

14. (Previously Presented) The bimodal polyethylene of Claim 1, wherein the zirconium or hafnium metal residuals content is 1.6 ppm to 5.0 ppm.

15. (Previously Presented) The bimodal polyethylene of Claim 1, wherein the zirconium or hafnium metal residuals content is 1.8 ppm to 5.0 ppm.

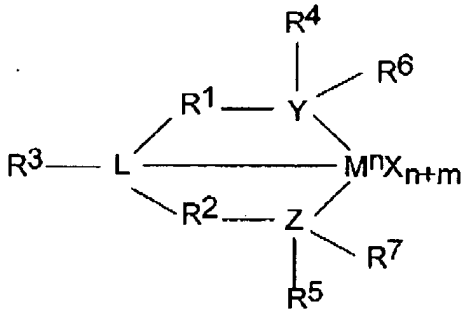
16. (Previously Presented) The bimodal polyethylene of Claim 1, wherein the zirconium or hafnium metal residuals content is 2.0 ppm to 5.0 ppm.

17. (Cancelled)

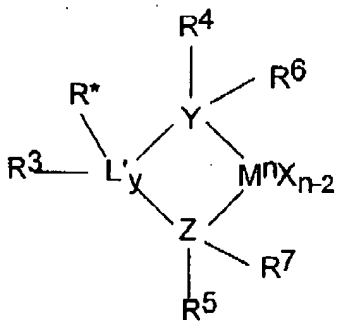
18. (Previously Presented) The bimodal polyethylene of Claim 1, wherein the zirconium or hafnium metal residuals content is 1.6 ppm to 2.0 ppm.

19. (Cancelled)

20. (Previously presented) A bimodal polyethylene consisting of ethylene derived units and units derived from at least one of a C_4 to C_{12} olefin; wherein the polyethylene consists of a density of from 0.940 to 0.970 g/cm^3 an I_{21}/I_2 of 80 or more; a residual zirconium or hafnium metal content; a Mw/Mn of from 20 to 80; and wherein the polyethylene consists of a high molecular weight component and a low molecular weight component, the high molecular weight component present from 40 to 60 weight percent based on the total polyethylene, and wherein the high molecular weight component has a weight average molecular weight Mw of greater than 100,000 a.m.u., and wherein the high molecular weight component has a Mw/Mn between 4.50 and 6.88, wherein said bimodal polyethylene consists of a nitrogen containing ligand detectable by High Resolution Mass Spectroscopy (HRMS), wherein said bimodal polyethylene is formed in a single reactor by contacting olefins and a catalyst composition comprising a Group 15 containing compound and a bulky ligand metallocene catalyst compound; wherein the Group 15 containing metal compound is represented by the formulae:



or



wherein M is a Group 4, 5 or 6 metal;

each X is independently a leaving group;

y is 0 or 1;

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m is the formal charge of the ligand comprising the YZL or YZL' groups;

L is Nitrogen;

L' is a Group 15 or 16 element or Group 14 containing group;

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R^1 and R^2 are independently a C_1 to C_{20} hydrocarbon group, a heteroatom containing group having up to twenty carbon atoms, silicon, germanium, tin, lead, or phosphorus; wherein R^1 and R^2 may be interconnected to each other;

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R^6 and R^7 are independently absent, hydrogen, an alkyl group, halogen, heteroatom or a hydrocarbyl group; and

R^* is absent, hydrogen, a Group 14 atom containing group, a halogen, or a heteroatom containing group, and

wherein a polyethylene pipe comprising the bimodal polyethylene has a predicted D-4 Tc for 110 mm pipe of less than -5°C when tested according to ISO DIS 13477/ASTM F1589.